REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and these remarks.

Claims 1, 3-5, 48, 50-53, 55-60 and 62-66 are requested to be cancelled. Claims 2, 6-26, 28-36, 38-46, 49, 54, 61 and 67 are amended currently. Upon entry of this response, therefore, claims 2, 6-47, 49, 54, 61 and 67 will be pending.

Election/Restriction

Applicants acknowledge the Examiner's interpretation of the election as being without traverse. Applicants note that the Examiner has deemed claim 49 as being drawn to a non-elected invention and, hence, withdrawn from further consideration. Applicants submit that this claim, as amended, is properly dependent. Applicants respectfully request, therefore, that the Examiner consider claim 49 presently.

Objections to the Claims

The Examiner has objected to the use of "OMP" in claims 2, 7, 18, 19, 28, 29, 38, 39, 54 and 55. Accordingly, this acronym was replaced with the term "outer membrane protein" in claims 2, 7, 18, 19, 28, 29, 38, 39, 54 and 55. With the objection thus overcome, Applicants respectfully request its withdrawal.

Rejection under 35 USC § 101

Claims 2, 6, 7, 8, 14, 15, 16, 19, 23, 24, 25, 29, 30, 33, 34, 35, 39, 43, 44 and 45 were rejected for alleged coverage of non-statutory subject matter.

To indicate the "hand of man" in the present invention, the term "antibody" was replaced by the phrase "isolated antibody" in claims 2, 6, 7, 8, 14, 15, 16, 19, 23, 24, 25, 29, 30, 33, 34, 35, 39, 43, 44 and 45. Accordingly, Applicants request withdrawal of this rejection.

Rejection under 35 U.S.C. § 112 First Paragraph

Claims 18-47 were rejected for an alleged lack of enabling support. In particular, the Examiner states that the specification does not provide sufficient assurance that the required deposits of the hybridomas of the present invention have been made. A "Declaration Regarding Deposit of Microorganisms" was submitted to the USPTO on September 16, 2005, however, as evidenced by the accompanying courtesy copy. The rejection has been overcome, therefore, and Applicants request its withdrawal.

Claims 54, 55, 60, 61, 66 and 67 also were subject to a "non-enablement" rejection. In claims 54, 55, 60, 61, 66 and 67, the phrase "alveolar bone resorption" has been revised to "alveolar bone resorption due to *P. gingivalis*," while claims 55, 60 and 66 have been cancelled. In light of these changes, Applicants respectfully request withdrawal of this rejection.

Rejection under 35 USC § 112 Second Paragraph

Claims 2, 6-47, 54-55, 60-61 and 66-67 were rejected for alleged indefiniteness. In particular, the Examiner believes it is "not clear in the claims which functional fragment thereof is being referred to."

To clarify this point, in claims 2, 6-47, 54-55, 60-61 and 66-67 the phrase "a functional fragment thereof" has been replaced with "a functional fragment of the antibody." Accordingly, Applicants request that the rejection be withdrawn.

Claims 25, 35 and 45 also were rejected for an alleged lack of clarity. In response, claims 25, 35 and 45 have been amended to depend on claims 18, 28, and 38, respectively. In light of these changes, Applicants respectfully request that the rejection be withdrawn.

Rejection under USC § 102(b)

Claims 2, 6, 7, 9, 10, 14, 15, 54, 55, 60 and 61 were rejected for alleged anticipation by Saito *et al.*, *Gen. Pharamc.* Vol. 28, p. 657-680, 1997 (Saito) and Abiko *et al.*, *Infection and Immunity*, Sept. p. 3966-3969, 1997 (Abiko). According to the Examiner, both of Saito and Abiko disclose an

antibody-binding to 40kDa outer membrane protein, which is said to inhibit coaggregation of *P. gingivalis* and *Actinomyces viscosus*. The Examiner further contends that the antibodies disclosed by each of Saito and Abiko inherently possess the ability to promote neutorphilic phagocytosis and to suppress alveolar bone resorption.

The presently claimed invention is directed to an antibody that possesses the ability to promote phagocytosis of *P. gingivalis* by leukocytes such as neutorphils. Applicants disagree with the Examiner's assertion that antibody binding will inherently result in neutrophilic phagocytosis.

The ability of an antibody to induce phagocytosis is dependent, in part, upon the antibody biding site on the target molecule, as well as its ability to interact subsequently with receptors on phagocytotic cells, such as a leukocytes. In support of this view, the attached article by Christiaansen *et al.* describes how the spatial orientation of an antibody bound to a target cell influences the efficiency of phagocytosis, by affecting the efficiency of interaction between the antibody-target complex and receptors of the phagocytic cells. Christiaansen demonstrates that specific antibodies that bind to target cells will vary in their ability to interact with receptors on phagocytic leukocytes.

> Although monoclonal (mAb) can elicit potent ADCC by human K lymphocytes, different mAb. even of the same antibody subclass Or even of the same target antigen specificity. vary considerably as to their efficiency in eliciting ADCC.

As a result, there also will be variation in the phagocytotic efficiency induced by complexes of antibodies bound to target cells.

Accordingly, induction of phagocytosis is not a necessary ("inherent") property of any antibody, simply by virtue of its ability to bind a target; rather, it constitutes a separate and distinct characteristic of *some* antibodies, pursuant to Applicants' claimed invention. This *a priori* unpredictable, phagocytosis-inducing activity of the claimed antibodies is disclosed in Example 10. In contrast, the skilled artisan could have inferred nothing along these lines from the silence, on the

part of both Saito and Abiko, regarding any phagocytosis induction associated with the binding to target of the prior-art antibodies.

Contrary to the Examiner's contention that antibody binding would inherently produce the cellular response of the presently claimed invention, Christiaansen taught that,

> Because the target antigen per se does not determine the ADCC effectiveness of a mAb (e.g., see Fig. 1), it is proposed here that exact region on the target antigen (the epitope) to which this mAb binds orients the antibody relative to other structures on the target cell membrane in such a way as to either permit or prevent the necessary Fc-FcR interactions for triggering ADCC.

Thus, the art at the time of filing taught that antibody binding would produce a wholly unpredictable cellular response, due to the high degree of antibody-antigen variability (compare Applicants' Example 10 at page 32 and 33 of the application). Therefore, the Examiner's contention that the work of Saito and Abiko inherently possessed the properties of the presently claimed invention is not in agreement with the art at the time of filing.

The presently claimed invention thus is patentably distinguishable over the disclosures of Saito and Abiko, respectively. Furthermore, neither reference even hints at the prospect that antibody binding to 40 kDa outer membrane protein might suppress alveolar bone resorption, a phenomenon for which there was no known correlate or reasonable expectation. Thus, the record simply does not comport with the Examiner's unsupported contention that antibody binding would inherently (*i.e.*, necessarily) result in suppression of alveolar bone resorption, which was Applicants' discovery.

In view of the foregoing, the presently claimed invention is patentably distinguishable over Saito and Abiko. Applicants therefore respectfully request withdrawal of this rejection.

Rejection under U.S.C. § 103(a)

Claims 2, 6, 7, 9, 10, 14, 15, 54, 55, 60 and 61 were rejected f over Saito in view of Abbas *et al.*, CELLULAR AND MOLECULAR IMMUNOLOGY 4th ed., pages 55 and 477 (Abbas). Claims 11 and 12 were rejected over Saito and Abbas in view of Carroll *et al.*, U.S. Patent No. 6, 660, 267 (Carroll). Claim 13 was rejected over Saito, Abbas, and Carroll in view of Alakhov *et al.*, U.S. Patent No. 5,840,319 (Alakhov).

Claims 2, 6, 7, 8, 10, 14, 15, 54, 55, 60 and 61 stand rejected over Abiko in view of Abbas. Claims 11 and 12 were rejected over Abiko and Abbas in view of Carroll. Claim 13 was rejected over Abiko, Abbas, and Carroll in view of Alakhov.

Applicants respectfully traverse each of these rejections. As discussed above, neither Saito nor Abiko discloses an antibody that, upon binding to the outer membrane protein, inhibits co-aggregation of *P. gingivalis* and *Actinomyces viscosus* and induces neutorphilic phagocytosis. In addition, neither reference suggests an antibody that has the ability to suppress alveolar bone resorption.

Especially in view of Christiaansen, the skilled artisan would have had no reasonable basis for expecting an antibody that can bind a target also to inhibit co-aggregation, to induce neutorphilic phagocytosis, and to suppress alveolar bone resorption. It necessarily follows that no combination of Saito or Abiko with the above-mentioned secondary references could have led the skilled artisan to an antibody possessing this unheralded set of properties.

Thus, the antibodies of the claimed invention would not have been obvious in view of the cited prior art. Applicants therefore request withdrawal of these rejections.

CONCLUSION

Applicants submit that the present application is in condition for allowance, and they request an early indication to the effect. Examiner Ogunbiyi is invited to contact the undersigned directly, should he feel that any issue warrants further consideration.

The Commissioner is hereby authorized to charge any additional fees, which may be required under 37 CFR §§ 1.16-1.17, and to credit any overpayment to Deposit Account No. 19-0741. Should proper payment not accompany this response, then the Commissioner is authorized to charge the unpaid amount to the same account. If any extension is needed for timely acceptance of submitted papers, then Applicants hereby petition for such extension under 37 CFR §1.136 and authorize payment of the relevant fee(s) from the deposit account.

Respectfully submitted,

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